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(54) **Hard-surface cleaning compositions.**

(57) Liquid hard-surface cleaning compositions are disclosed which have a viscosity above 30 cps, show excellent cleaning on both kitchen and bathroom soils, and excellent shine performance.

These compositions are substantially free of hydrotropes, and contain a narrowly-defined binary solvent system constituted of Butyl Carbitol on one hand and Butoxy Propoxy Propanol or hexyl Carbitol on the other hand.

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HARD-SURFACE CLEANING COMPOSITIONS

Technical Field

5 The present invention relates to liquid hard-surface cleaning compositions which have a viscosity above 30 cps, show excellent cleaning on both kitchen and bathroom soils, and excellent shine performance.

These compositions are substantially free of hydrotropes, and contain a narrowly-defined binary solvent system constituted of Butyl Carbitol on one hand and Butoxy Propoxy Propanol or hexyl Carbitol on the other hand.

Background

15 It is well-known to formulate hard-surface cleaning compositions containing solvents.

In particular, compositions containing a binary solvent system constituted of terpenes and polar solvents such as benzyl alcohol and butyl carbitol have been disclosed in European Patents 0 040 882 and 0 080 749.

20 There is a need for hard-surface cleaners containing organic solvents, which are substantially free of hydrotropes, since hydrotropes such as cumene sulfonate can be detrimental to performance, especially shine.

25 There is also a need for liquid hard-surface cleaners which are more viscous than current similar products, i.e. which have a viscosity above 30 cps. Indeed, a product with such a viscosity, will show a better pouring control, will avoid product loss by penetration into e.g. the sponge used to apply it on the surface, and will be more efficient for use on inclined surfaces. Viscous products can be formulated using thickening agents typically used in commercial products. The rheology of such compositions is generally less desirable than that of the current invention. Thickening agents can also be detrimental to product performance.

30 It has now been found that liquid hard-surface cleaning compositions can be formulated, which are substantially free of hydrotrope, are substantially viscous and show remarkable cleaning efficiency on both kitchen and bathroom soils, and shine performance. such compositions contain a specific binary solvent system.

35 EP-A 0 165 885 discloses concentrated liquid hard-surface cleaning compositions containing a ternary active system having hydrotroping properties. US-3,591,510 relates to the use of propylene-glycol derivatives in dilute liquid hard-surface cleansers.

It is an object of the present invention to provide a liquid hard-surface cleaner composition with excellent cleaning on kitchen and bathroom soils and very good shine performance.

40 It is another object of the present invention to provide a liquid hard-surface cleaner which has a viscosity above 30 cps.

Summary of the Invention

45 The present invention relates to a liquid hard-surface cleaning composition containing

- from 3% to 10% of surface-active agent
- from 3% to 10% of a binary solvent mixture consisting of Butyl Carbitol on one hand, and n-Butoxy Propoxy Propanol or hexyl carbitol on the other hand, in a weight ratio of 4/1 to 1/4;
- from 1% to 10% of a builder and from 0.5% to 8% of a buffer, at a ratio of buffer to builder from 3/1 to 1/3
- 50 - less than 1.5% of hydrotrope.

Detailed Description of the Invention

The surface-active agents, the solvent and the optional ingredients are described in more detail hereinafter.

Unless indicated to the contrary, the %-indications stand for "% by weight".

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Surface-active Agents

Water-soluble deterative surfactants useful herein include well-known synthetic anionic, nonionic, amphoteric and zwitterionic surfactants and mixtures thereof. Typical of these are the alkyl benzene sulfates and sulfonates, paraffin sulfonates, olefin sulfonates, alkoxyated (especially ethoxyated) alcohols and alkyl phenols, amine oxides, sulfonates of fatty acids and of fatty acid esters, and the like, which are well-known in the detergency art. In general, such deterative surfactants contain an alkyl group in the C_{10} - C_{18} range; the anionic deterative surfactants are most commonly used in the form of their sodium, potassium or triethanolammonium salts. The nonionics generally contain from 3 to 17 ethylene oxide groups per mole of hydrophobic moiety. Especially preferred in the compositions of the present invention are: C_{12} - C_{16} alkyl benzene sulfonates, C_{12} - C_{18} paraffin-sulfonates and the ethoxyated alcohols of the formula $RO(CH_2CH_2O)_nH$, with R being a C_{12} - C_{15} alkyl chain and n being a number from 3 to 10.

Anionic surfactants are frequently present at levels from 3 to 8% of the composition. Nonionic surfactants if used, are typically used at levels between 1% to 5% by weight of the composition. Mixtures of the like surfactants can also be used. The total level of surface-active agents in the present concentrated compositions is from 3% to 10% by weight of the total composition.

25 The organic solvent

The organic solvent for use herein is constituted by a very specific binary system of a water-soluble solvent and a solvent of low water-solubility.

The water-soluble solvent is Butyl Carbitol i.e. 2-(2-butoxyethoxy)ethanol, and the water-insoluble solvent is selected from the group of n-Butoxy Propoxy Propanol, i.e. 1(2-n-butoxy-1-methylethoxy)propane-2-ol, and hexyl carbitol, i.e. 2-(2-hexoxyethoxy)ethanol. n-Butoxy Propoxy Propanol is the preferred solvent of low water-solubility.

The weight ratio of Butyl Carbitol to n-Butoxy Propoxy Propanol or Hexyl Carbitol is in the range from 4/1 to 1/4, preferably from 4/1 to 1/1.

35 The total level of solvent is in the range from 3% to 10% of the total composition, preferably 4% to 8%.

Builder/Buffer system

40 Also critical in the context of the present invention is the Builder/Buffer system.

The Builder should be present at levels of from 1% to 10% preferably 1% to 5% by weight of the total composition.

Compounds classifiable and well-known in the art as detergent builders include the nitrilotriacetates, (NTA), polycarboxylates, citrates, water-soluble phosphates such as tri-polyphosphate and sodium ortho- and pyro-phosphates, silicates, ethylene diamine tetraacetate (EDTA), amino-polyphosphonates (DEQUEST), phosphates and mixtures thereof. Preferred builder for use in the present invention is sodium citrate.

The Buffer is used to adjust and buffer the pH to a 8-11 range, preferably about 10-10.8. It is represented by alkali metal carbonates, preferably sodium carbonate; and present at levels of from 0.5% to 8%, preferably from 1% to 3% of the total composition. the ratio between buffer and builder should be in the range from 3/1 to 1/3, preferably 3/1 to 1/1.

Product viscosity

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The viscosity of the present compositions is above 30 cps, preferably in the range from 30 to 110 cps, which is substantially higher than current liquid compositions, 3 to 5 cps.

These figures apply to viscosity as measured in a Brookfield LVDT viscometer, with Spindle N° 2, at

60 rpm (low shear).

Optional components are represented by ingredients typically used in commercial products to provide aesthetic or additional product performance benefits. Typical ingredients include pH regulants, perfumes, dyes, optical brighteners, soil suspending agents, deterative enzymes, gel-control agents, freeze-thaw stabilizers, bactericides, preservatives, and the like.

There is no need for a thickener in the present compositions.

Hydrotrope can be present, however at levels not exceeding 1.5%. Examples of suitable hydrotropes are urea, monoethanolamine, diethanolamine, triethanolamine and the sodium potassium, ammonium and alkanol ammonium salts of xylene-, toluene-, ethylbenzene- and isopropyl-benzene sulfonates.

The compositions herein typically contain water as a carrier. By way of example the water-level can vary in the range from e.g. 40% to 60%. Water-alcohol (e.g., ethanol, isopropanol, butanol, etc.) mixtures can also be used. Alkylated polysaccharides can be used to increase the stability and performance characteristics of the compositions.

The following examples are given by way of illustrating the compositions herein, but are not intended to be limiting of the scope of the invention.

Abbreviations	
LAS	Sodium Salt of Linear C ₁₁₋₁₈ Alkyl Benzene Sulfonate
NaPS	Sodium C ₁₃ -C ₁₆ paraffin sulfonate
NTA	Sodium nitrilotriacetate
n-BPP	n- Butoxy Propoxy Propanol

The following compositions are prepared :						
Ingredient	percentage by weight					
LAS	5	5	4	4	5	-
NaPS	-	-	2	1	-	-
Lauryl alcohol sulphate	-	-	-	-	-	5
Sodium Carbonate	3	3	3	2	4	3
Sodium Citrate	1	3	1	-	2	1
NTA	-	-	-	2	-	-
Butyl Carbitol	4	4	4	3	3	4
n-BPP	2	2	-	3	3	2
Hexyl Carbitol	-	-	2	-	-	-
Perfume	0.5	1.0	1.0	0.5	0.5	0.5
Dyes, miscellaneous, water	up to 100					
Product viscosity (cps)	90	100	70	70	110	50

The above compositions were found to show very good cleaning performance on both kitchen and bathroom soils, and excellent shine performance.

Claims

1. A liquid hard-surface cleaning composition containing

- from 3% to 10% of surface-active agent

- from 3% to 10% of a binary solvent mixture consisting of Butyl Carbitol on one hand, and n-Butoxy Propoxy Propanol or hexyl carbitol on the other hand, in a weight ratio of 4/1 to 1/4.

- from 1% to 10% of a builder and from 0.5% to 8% of a buffer, at a ratio of buffer to builder of from 3/1 to 1/3

- less than 1.5% of hydrotrope.

2. A composition in accordance with claim 1, wherein the binary solvent mixture consists in a mixture of Butyl Carbitol and n-Butoxy Propoxy Butanol, in a weight ratio of 4/1 to 1/1.

3. A composition in accordance with claim 1 wherein the builder is sodium citrate and the buffer is sodium carbonate, at a weight ratio of buffer to builder of 3/1 to 1/1.

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EUROPEAN SEARCH REPORT

Application Number

EP 89 20 0144

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 4)
P,X	EP-A-0 273 472 (THE PROCTER & GAMBLE CO.) * page 2, lines 44-49; page 3, lines 28-37; page 4, lines 1-7, 17-22; claims 1-5 *	1	C 11 D 3/43 C 11 D 3/20 C 11 D 3/16 C 11 D 17/00 C 11 D 3/44
A	---	2,3	
A	EP-A-0 105 063 (THE PROCTER & GAMBLE CO.) * claims *	1-3	
A,D	--- US-A-3 591 510 (W.E. ZENK) * claims *	1-3	
A,P	--- EP-A-0 261 874 (THE PROCTER & GAMBLE CO.) * claims * -----	1-3	
			TECHNICAL FIELDS SEARCHED (Int. Cl. 4)
			C 11 D
The present search report has been drawn up for all claims			
Place of search BERLIN		Date of completion of the search 15-02-1990	Examiner PELLI-WABLAT B
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ----- & : member of the same patent family, corresponding document			